



Department of Chemistry and Biochemistry
Physical Chemistry Seminar Series

Carlos Larriba Andaluz

Indiana University—Purdue University Indianapolis

Monday, October 15~ 2:00 pm 331 Klamath Hall

Principles, applications and new developments in Ion Mobility Spectrometry

Abstract

Over the past several decades, Ion Mobility Spectrometry (IMS) technology has evolved into an inexpensive and powerful analytical technique for the detection of gas phase analytes. It has proven to be very attractive with several advantages such as low detection limits, high transmission, reasonable selectivity and strong potential for miniaturization and portability. IMS instrumentation has an incredibly wide range of applications which include, among others, chemical warfare monitoring; trace detection of explosives; air quality analysis; airport security; environmental analysis; process control; medical diagnostics; proteomics analysis; drug detection; and forensic.

Despite new advances in applications, there has not been a strong parallel theoretical and numerical development, with many of the instruments used nowadays being very similar to those already existing in the XX century, while new instruments, which use high fields or complex gas-ion couplings, lack a strong ion transport theory. The reason behind this dearth of improvement is that, unlike Mass Spectrometry systems which separate analytes based solely on an integral property of the molecule, mass over charge, Ion Mobility Spectrometry separates analytes based on size over charge, where the size is an intricate combination of gas parameters, forces applied and potential interactions between ion and buffer gas.

An evolution of how ion mobility has been inferred during the past century, of where the theory succeeds or fails experimentally, and of which advances are giving way to a revolution in IMS will be presented.

Refreshments served at 1:45 pm 331 Klamath Hall

Hosted by Jim Prell